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EXAMINER

LEUNG, JENNIFER A

ART UNIT PAPER NUMBER

1764

DATE MAILED: 09/16/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/751,512

Applicant(s)

ESPEILLAC ET AL

Examiner

Jennifer A. Leung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/001,486.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in the parent application.
2. The specification should be updated for proper reference to the parent application. On page 1, under "Related Application" the statement, "This application is a divisional of ALLOWED U.S. application Serial No. 09/001,486 filed December 31, 1997." should be changed to: -- This application is a divisional of U.S. application Serial No. 09/001,486 filed December 31, 1997, now U.S. Patent No. 6,217,749. --

Specification

3. The abstract of the disclosure is objected to because it exceeds 150 words in length and is not limited to a single paragraph. Correction is required. See MPEP § 608.01(b).
4. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 11-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Regarding claim 11, it is unclear as to the relationship between "said/the hydrotreatment reactor" (lines 7, 15, 23, 24) and the "at least one separate hydrotreatment reactor" (line 5), since the limitation includes a plurality of reactors. See also claims 17 and 18. Also, it is unclear as to which zones are intended by, "one of said zones" and "the other of said zones" in lines 17 and 19, since three zones are recited (i.e., a vaporization zone and two distinct injection zones).

Regarding claim 13, line 2 and claim 15, lines 2 and 6, "the separation means" lacks proper positive antecedent basis. Also, in claim 16, line 2, "the horizontal separation means" lacks proper positive antecedent basis.

Regarding claim 14, it is unclear as to the positive structural limitation applicants are attempting to recite by the phrase, "a cylindrical element disposed inside and preferably concentrically with the vertical wall of the fractionation unit," since the term "preferably" renders the claim vague and indefinite.

Regarding claims 19 and 20, "said reactor having a more specific action" recited in line 4 is considered vague and indefinite, as it is unclear as to what applicants consider to be "a more specific action" and it is unclear as to the structural limitation said action provides to the apparatus. Also, "said other reactor" (line 4) lacks proper positive antecedent basis.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United

States and was published under Article 21(2) of such treaty in the English language.

6. Claims 11, 12 and 15-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Gupta (US 5,720,872).

*** Note that Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.*

Regarding claim 11, Gupta discloses an apparatus (FIG. 1; column 3, line 26 to column 5, line 47) comprising:

a hydrocarbon feedstock supply (fed via line 11); a desulfurization reactor 1a fed by said supply; at least one separate hydrotreatment reactor 1b (i.e., FIG. 2 shows plural separate hydrotreatment reactors); a fractionation unit 2 disposed between the desulfurization reactor 1a and said hydrotreatment reactor 1b, said fractionation unit 2 containing an internal partitioning structure 18 defining two distinct injection zones 16a, 16b in flow communication with a common upper vaporization zone; and an evacuation line 25 for withdrawal downstream of light fractions from the vaporization zone; wherein said fractionation unit 2 comprises separate lines 13/17 and 27 for carrying, respectively, the effluents from the desulfurization reactor 1a and hydrotreatment reactor 1b to the fractionation unit 2, with one of said lines 13/17 carrying the effluent from the desulfurization reactor 1a into zone 16a, and the other of said lines 27 carrying the effluent from the hydrotreatment reactor 1b into zone 16b; and wherein the fractionation unit 2 comprises two different draw-off lines 19 and 23 through which are removed from the injection zones 16a and 16b, respectively, the liquid bottoms of the effluent of the desulfurization reactor 1a that are passed on to the hydrotreatment reactor 1b (via line 19), and the effluent from the hydrotreatment reactor 1b that are passed on downstream (via line 23).

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Regarding claim 12, Gupta discloses desulfurization reactor **1a** is a hydrodesulfurization or sweetening reactor (i.e., comprising catalyst **10a**, for hydrotreating various petroleum feedstocks to remove heteroatoms like sulfur; column 2, lines 14-25, 34-36).

Regarding claim 15, Gupta discloses the separation means (internal partitioning structure **18**; FIG. 1) is horizontal, and lines **13/17** and **27**, which carry the effluents from the desulfurization reactor **1a** and from the hydrotreatment reactor **1b** respectively, end at different heights of the fractionation unit **2**, respectively above (zone **16a**) and below (zone **16b**) the horizontal position of the separation means **18**.

Regarding claim 16, Gupta discloses the horizontal separation means **18** is a tray provided with at least one riser (see FIG. 1).

Regarding claims 17 and 18, Gupta discloses the hydrotreatment reactor **1b** is a hydrodesulfurization reactor (i.e., comprising catalyst **10b**, for hydrotreating various petroleum feedstocks to remove heteroatoms like sulfur; column 2, lines 14-25, 34-36).

Regarding claims 19 and 20, Gupta discloses another reactor (for downstream reaction stages) wherein the light fractions removed via evacuation line **25** (i.e., condensed vapor/distillates) are treated, said another reactor having a more specific action (i.e., hydrocracking, aromatic saturation, ring-opening; column 7, lines 17 to column 8, line 19).

Instant claims 11, 12 and 15-20 structurally read on the apparatus of Gupta.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta (US 5,720,872) in view of Lacy et al. (U.S. 3,314,879).

Although Gupta is silent as to whether the horizontally disposed separator **18** (FIG. 1) may comprise a vertical partition extending from the bottom of the fractionation unit **2**, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to substitute a vertical partition for the horizontal separator **18** in the apparatus of Gupta, on the basis of suitability for the intended use and absent showing any unexpected results, since said configuration is conventionally known in the art, as evidenced by Lacy et al. (see Figure for fractionation tower **1** separated into Zones **A** and **B** by baffle plate **2**; column 1, lines 43-69) and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

8. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gupta (US 5,720,872) in view of Egloff (U.S. 1,707,349).

Although Gupta is silent as to whether the horizontally disposed separator **18** (FIG. 1) may comprise a cylindrical element disposed inside and preferably concentrically with the

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vertical wall of the fractionation unit 2, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to substitute a cylindrical element for the horizontal separator 18 in the apparatus of Gupta, on the basis of suitability for the intended use and absent showing any unexpected results, since such separation means is conventionally known in the art, as evidenced by Egloff, and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958). In particular, Egloff (Figure; page 1, line 11 to page 2, line 3) teaches a chamber 3 comprising an inner zone and outer annular zone, as defined by a cylindrical element 4 disposed within and concentric with the chamber wall. The outer annular zone comprises an inlet line 15 and an outlet line 18, the inner zone comprises an inlet line 17 and an outlet line 31, and both the inner and outer zones communicate with a common evacuation line 20.

9. Claims 11-13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pruiss (U.S. 3,519,557) in view of Mellbom (U.S. 3,544,428).

Regarding claim 11, Pruiss (Figure) discloses an apparatus comprising:

- a hydrocarbon feedstock supply (charge; column 2, line 63 to column 3, line 6);
- a desulfurization reactor (reactor 1; column 1, lines 40-44) fed by said supply;
- at least one separate hydrotreatment reactor (reactor 2; column 3, lines 58-63);
- a first fractionation unit (flash tower 1) disposed between the desulfurization reactor 1

and said hydrotreatment reactor 2, comprising a first effluent line (not labeled) for carrying the effluent exiting from reactor 1 to flash tower 1, a first evacuation line (not labeled) for withdrawal of the light fraction from flash tower 1, and a first draw-off line (not labeled) for

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withdrawal of the liquid bottoms from flash tower 1; and

- a second fractionation unit (flash tower 2) disposed downstream from the said hydrotreatment reactor 2, comprising a second effluent line (not labeled) for carrying the effluent exiting from reactor 2 to flash tower 2, a second evacuation line (not labeled) for the withdrawal of the light fraction from flash tower 2, and a second draw-off line (not labeled) for withdrawal of the liquid bottoms from flash tower 2;

wherein the first and second evacuation lines are in fluid communication and are connected to define a common evacuation line (see Figure) for carrying the vaporized light fractions exiting from both flash towers 1 and 2; and

wherein the first and second draw-off lines are separate; the first draw-off line passing the bottoms of the effluent of desulfurization reactor 1 to hydrotreatment reactor 2, and the second draw-off line passing the bottoms of the effluent of hydrotreatment reactor 2 downstream.

Pruiss is silent as to whether the first fractionation unit 1 and the second fractionation unit 2 may be integrated to define the instantly recited single fractionation unit, wherein the single fractionation unit comprises an internal partitioning structure defining two distinct injection zones in flow communication with a common upper vaporization zone, as well as separate effluent and draw-off lines for each of the injection zones, respectively.

Mellbom teaches an apparatus for fractionating two hydrocarbons streams of different chemical composition in a single fractionation tower, wherein it is desirable for the bottom products to be maintained separate. The apparatus comprises a shell 1 defining an upright elongated chamber having a common upper vaporization zone 2, wherein the chamber is divided into two separate and distinct injection zones 4 and 8 by a partition 9. A common evacuation

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line (outlet 5) is provided for the withdrawal of vaporized light fractions; separate effluent lines 14 and 15 are provided for feeding the effluents from upstream processes to each of zones 4 and 8, respectively; and separate draw-off lines 20 and 22 are provided for the withdrawal of the liquid bottoms from each of zones 4 and 8, respectively. (Figure; column 3, lines 13-65).

It would have been obvious for one of ordinary skill in the art at the time the invention was made to integrate the separate flash towers 1 and 2 of Pruiss to define a single fractionation unit, because a single unit saves the expense of duplicate facilities and/or costly shutdowns, as taught by Mellbom (column 1, lines 28-38). Also, in view of the particular configuration disclosed by Pruiss (i.e., substantially the separate vessel configuration described by Mellbom in column 1, lines 39-55), the integration of vessels overcomes certain prior art disadvantages, such as the requirement for additional foundations and support members for a second vessel, the requirement of large connecting pipes to minimize pressure drops between separate vessels, and differential expansion problems that are likely to arise when flashing zones are operated at different temperatures. In any event, it has been held that making elements integral involves ordinary skill in the art. *Nerwin v. Erlichman* 168 USPQ 177 (PO BdPatApp 1969); *In re Wolfe* 116 USPQ 443 (CCPQ 1958); *In re Howard* 150 US 164 (USSC 1893).

Regarding claim 12, Pruiss discloses desulfurization reactor 1 is a hydrodesulfurization or sweetening reactor (i.e., hydrogenation involving removal of sulfur; column 1, lines 40-44).

Regarding claim 13, in the modified apparatus of Pruiss, the separation means comprises a horizontally disposed partition 9 (as modified by the teaching of Mellbom). Additionally, Mellbom (column 1, lines 56-66) cites a fractionation unit of the prior art that utilizes a single fractionation vessel comprising separate zones defined by vertically partitioning the lower end of

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the vessel. Therefore it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide a vertical partition for the horizontal partition in the modified apparatus of Pruiss, on the basis of suitability for the intended use, since such a fractionation unit configuration is conventionally known in the art, as evidenced by Mellbom. Furthermore, substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

Regarding claim 15, the separation means (partition 9) as taught by Mellbom comprises a horizontal partition (Figure), and lines 14 and 15 carry the effluents from the separate upstream processes to the fractionation unit. Lines 14 and 15 are located at different heights, respectively above and below the horizontal position of separation means 9. Regarding the specifically recited effluent feeding configuration (i.e., injecting the effluent from the desulfurization reactor 1 into the upper injection zone and the effluent from the hydrotreatment reactor 2 to the lower injection zone), it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to select an appropriate configuration for injecting the effluents in the modified apparatus of Pruiss, since the shifting location of parts was held to have been obvious, and where the general conditions of a claim are disclosed in the prior art, discovering the optimum configuration only involves ordinary skill in the art.

Regarding claim 16, the horizontal separation means 9 of Mellbom comprises a tray provided with at least one riser (conduit means 11; Figure; column 3, lines 34-39).

Regarding claims 17 and 18, Pruiss discloses hydrotreatment reactor 2 may comprise a hydrodesulfurization reactor (i.e., hydrogenation with removal of sulfur; column 1, lines 40-44).

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Regarding claims 19 and 20, Pruiss discloses another reactor wherein are treated the light fractions removed from the fractionation unit through the evacuation line, said other reactor having a more specific action depending on the residual content of sulfur or aromatic compounds of said light fractions (i.e., a reactor 3, which may be used for conducting hydrogenation reactions involving bond saturation; removal of sulfur, nitrogen and heavy metal contaminants; or cracking, column 1, lines 40-44; OR a specific action of H₂ scrubbing in tower 4; OR product fractionation in tower 5).

10. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pruiss (U.S. 3,519,557) in view of Mellbom (U.S. 3,544,428), as applied to claim 13 above, and further in view of Egloff (U.S. 1,707,349).

Although the collective teachings of Pruiss and Mellbom are silent as to whether the partition may comprise a cylindrical element disposed inside and preferably concentric with the vertical wall of the fractionation unit to divide the unit into plural zones, it would have been an obvious design choice for one of ordinary skill in the art at the time the invention was made to provide such a partition in the modified apparatus of Pruiss, on the basis of suitability for the intended use and absent showing any unexpected results therefore, since such a partition configuration is conventionally known in the art, as evidenced by Egloff (the same comments apply), and the substitution of known equivalent structures involves only ordinary skill in the art. *In re Fout* 213 USPQ 532 (CCPA 1982); *In re Susi* 169 USPQ 423 (CCPA 1971); *In re Siebentritt* 152 USPQ 618 (CCPA 1967); *In re Ruff* 118 USPQ 343 (CCPA 1958).

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Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Gupta U.S. '052 is related to Gupta U.S. '872, cited above.
- Hamblin and Adams were cited as relevant documents of the parent application.

* * *

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A. Leung whose telephone number is 703-305-4951.

The examiner can normally be reached on 8:30 am - 5:30 pm M-F, every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola can be reached on 703-308-6824. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Jennifer A. Leung

September 8, 2003



**HIEU TRAN
PRIMARY EXAMINER**